

five ocular plates are small and heart-shaped, their apex is directed towards the anal opening, and their base to the area; the madreporiform tubercle is slightly elevated on the single ovarial plate, and the surface of the discal plates is almost destitute of sculpture or granulation.

*Affinities and differences.*—*D. Mooreii* resembles *D. depressum*, Ag., in the depression of its upper surface and the flatness of its base, likewise in having the tubercles of both areas of nearly a uniform size around the base; but it is readily distinguished from *D. depressum* by the number and greater development of the tubercles of the ambulacra, which maintain their size throughout; whilst in *D. Mooreii* the ambulacral tubercles are fewer in number and rudimentary in size in all the upper part of the areas. The contour of the test moreover does not assume the pentagonal outline of *D. depressum*, nor has the upper surface of the interambulacral areas the median depression seen on the test of the latter. The mouth-opening is larger, and the decagonal lobes are more equal in size in *D. Mooreii* than in *D. depressum*.

*Locality and stratigraphical range.*—We have collected *D. Mooreii* in the Upper Lias of Gloucestershire. Mr. Moore found it in the same stratum near Ilminster with *Ammonites communis* and *A. serpentinus*. Professor Deslongchamps has communicated a specimen of this Urchin which he found in the Lias supérieure of May, Calvados, associated with *Leptæna Davidsonii* and *Thecidea Bouchardii* and several other species.

We dedicate this species to Mr. Moore, of Ilminster, whose assiduous researches have brought to light so many interesting forms from the Upper Liassic beds of Somersetshire.

[To be continued.]

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XVII.—*Descriptions of some newly discovered species of Araneidea.* By JOHN BLACKWALL, F.L.S.

Tribe OCTONOCULINA.

Family SALTICIDÆ.

Genus *Salticus*, Latr.

*Salticus promptus.*

Length of an immature female  $\frac{3}{20}$ ths of an inch; length of the cephalo-thorax  $\frac{1}{16}$ ; breadth  $\frac{1}{24}$ ; breadth of the abdomen  $\frac{1}{20}$ ; length of a posterior leg  $\frac{1}{10}$ ; length of a leg of the second pair  $\frac{1}{12}$ .

The cephalo-thorax is large, glossy, nearly quadrilateral, ab-

ruptly sloped behind, depressed and prominent before, projecting beyond the base of the falces; it is of a fulvous colour, with the entire space between the eyes, a line extending along the middle of its posterior half, several oblique ones on the sides of that part, and the margins of a black hue, the cephalic region having a slight tinge of brown, and the anterior eyes are surrounded with white hairs. The falces are small, conical, vertical, and have a few minute teeth on their inner surface; the maxillæ, which are straight, are enlarged and rounded at the extremity; the lip is moderately long and rounded at the apex; and the sternum has a regular oval form. The colour of these parts is pale yellowish brown, the sternum having a broad black border. The legs are robust, particularly those of the anterior pair, and are provided with hairs and sessile spines, two parallel rows of the latter occurring on the inferior surface of the tibiæ and metatarsi of the anterior legs; the fourth pair is the longest, the first pair rather surpasses the third, and the second pair is the shortest; their colour is pale yellowish brown, and there is an irregular black spot on the upper part of the coxæ of the posterior pair, and a curved one at the extremity of the femora of the anterior pair, on the under side; each tarsus is terminated by two curved, slightly pectinated claws, below which there is a small scopula. The palpi resemble the legs in colour, and have a few black spots on the cubital, radial, and digital joints, in front. The abdomen is oviform, convex above, projecting a little over the base of the cephalo-thorax; it is clothed with black and short hoary hairs, and is of a fulvous colour, with curved, transverse, oblique rows of black spots, more or less confluent, extending from the upper part to the sides; and on the under part numerous black spots are distributed without regularity; the branchial opercula have a pale yellowish tint; and there is a longitudinal black streak on the upper part of each superior spinner.

In October 1853 an immature female of this species, which is nearly allied to *Salticus frontalis* and *Salticus reticulatus*, was received from the Rev. Hamlet Clark, who took it near Northampton in the autumn of the same year.

#### *Salticus Jenynsii.*

Length of the female  $\frac{3}{16}$ ths of an inch; length of the cephalo-thorax  $\frac{1}{8}$ ; breadth  $\frac{1}{12}$ ; breadth of the abdomen  $\frac{1}{10}$ ; length of an anterior leg  $\frac{1}{4}$ ; length of a leg of the third pair  $\frac{3}{16}$ .

The legs are robust, especially those of the first and second pairs, and are provided with hairs and strong black spines; their colour is yellowish brown, a longitudinal black line extending

long the upper part of the femora, genua, and tibiæ; the anterior and posterior pairs, which are the longest, are equal in length, and the third pair is the shortest; each tarsus is terminated by two curved claws, below which there is a scopula. The palpi have a yellowish brown hue, the digital joint being the darkest. The cephalo-thorax is nearly quadrilateral, prominent in front, projecting beyond the base of the falces; it is covered with yellowish brown and black hairs intermixed, and has some long yellowish ones below the anterior row of eyes; a narrow black line occurs on the margins, immediately above which there is a longitudinal one of a yellowish brown hue. The falces are short, powerful, conical, and vertical; the maxillæ are straight, and enlarged and rounded at the extremity; and the lip is somewhat oval. These parts have a yellowish brown tint, with the exception of the bases of the maxillæ and lip, which have a dark brown hue. The sternum is small, oval, and of a brown colour, the margins being much the darkest. The abdomen is oviform, pointed at the spinners, convex above, projecting over the base of the cephalo-thorax; it is densely clothed with short yellowish brown hairs, interspersed with long black ones; a faint red-brown line passes from the spinners along the middle of the upper part, more than half of its length, and then separates into two diverging branches which extend to its anterior extremity and form a very acute angle; these red-brown lines have an obscure, narrow, whitish border, bounded by a faint red-brown parallel line, and an obscure whitish line bisects the angular space comprised between the diverging branches of the medial line; on the under part there is an obscure dark band, which tapers gradually from the sexual organs to the spinners; and the branchial opercula have a pale yellow hue.

It affords me much gratification to connect with this species of *Salticus* the name of so accomplished a naturalist as the Rev. Leonard Jenyns, M.A., F.L.S. &c., to whose liberality I am indebted for this opportunity of describing the adult female. It was comprised in a collection of spiders made in Cambridge-shire, and obligingly placed at my disposal by Mr. Jenyns in February 1853.

#### Family DRASSIDÆ.

#### Genus *Drassus*, Walck.

#### *Drassus propinquus*.

Length of male  $\frac{1}{6}$ th of an inch; length of the cephalo-thorax  $\frac{1}{16}$ ; breadth  $\frac{1}{24}$ ; breadth of the abdomen  $\frac{1}{24}$ ; length of a posterior leg  $\frac{1}{8}$ ; length of a leg of the third pair  $\frac{1}{8}$ .

The eyes are disposed on the anterior part of the cephalo-

thorax in two short, transverse, slightly curved, concentric rows, whose convexity is directed backwards, the intermediate ones of the anterior row being rather the smallest and darkest of the eight. The cephalo-thorax is oval, convex, glossy, with slight furrows on the sides converging towards a narrow indentation in the medial line; it is sparingly clothed with hoary hairs, some of which are disposed in three faint rows on each side, along the furrows; the falces are conical, vertical, and armed with a few minute teeth on the inner surface; the maxillæ are powerful, enlarged where the palpi are inserted, greatly dilated at the base, rounded at the extremity, and inclined towards the lip, which is longer than broad and rounded at the apex; the sternum is heart-shaped. These parts are of a brown colour, the margins of the cephalo-thorax and sternum, and the base of the lip being much the darkest. The legs are long, slender, provided with hairs and sessile spines, and are of a yellowish brown colour, with the exception of the femora of the first and second pairs which have a dark brown hue, those of the second pair being the paler; the fourth pair is rather longer than the first, which surpasses the second, and the third pair is the shortest; each tarsus is terminated by two plain curved claws, below which there is a small scopula. The palpi are robust; the humeral and cubital joints are somewhat darker coloured than the legs, and the radial and digital joints have a dark brown tint; the humeral joint has a gibbosity near its extremity on the under side, which is provided with short hairs, and the radial joint projects forwards, from its outer side, a very large curved apophysis, whose yellowish brown extremity is slightly bifid; the digital joint is of an elongated oval form, convex and hairy externally, concave within, comprising the palpal organs; these organs are highly developed, very protuberant at the base, which is convex and glossy, and have a small prominent process at the extremity; they are of a dark brown colour faintly tinged with red. The abdomen is oviform, glossy, thinly clothed with short hairs, convex above, projecting a little over the base of the cephalo-thorax, and is of a dark brown colour, the under part being the palest; there is a spot on each side of the anterior extremity, a fine line extending thence along the middle of the upper part nearly half of its length, and an oblique, transverse, curved line, whose extremities pass along the sides to the under part, and whose middle portion, abruptly curved forwards, is bisected by the point of the fine medial line; these marks are somewhat obscure, of a deep yellowish brown hue, and are sparingly covered with hoary hairs; a few white hairs form a minute spot immediately above the spinners, and the colour of the branchial opercula is brown.

Two adult males of *Drassus propinquus*, which is closely allied

to *Drassus nitens*, were captured in the spring of 1853; one running on a public road near Llanrwst, and the other in a window of the sitting-room at Oakland. In the summer of the same year Mr. R. H. Meade took an adult male of this species in Norfolk.

Family LINYPHIDÆ.

Genus *Linyphia*, Latr.

*Linyphia tenella*.

Length of the female  $\frac{1}{11}$ th of an inch; length of the cephalo-thorax  $\frac{1}{24}$ ; breadth  $\frac{1}{32}$ ; breadth of the abdomen  $\frac{1}{20}$ ; length of an anterior leg  $\frac{1}{6}$ ; length of a leg of the third pair  $\frac{1}{8}$ .

The cephalo-thorax is oval, convex, glossy, with an indentation in the medial line; the falces are conical, vertical, and armed with minute teeth on the inner surface; the maxillæ are straight, with the exterior angle at the extremity curvilinear. These parts have a brown tint, with the exception of the lateral margins of the cephalo-thorax, which are black. The lip is semicircular and prominent at the apex; and the sternum is convex, glossy, and heart-shaped. Both these parts have a very dark brown hue. The eyes are seated on black spots; those of each lateral pair are placed obliquely on a small tubercle and are contiguous, and the anterior eyes of the four intermediate ones forming the trapezoid are seated on a slight protuberance and are the smallest and darkest of the eight. The legs are long, slender, provided with hairs and fine spines, and have a light yellowish red tint; the first pair is the longest, the second pair slightly surpasses the fourth, and the third pair is the shortest; each tarsus is terminated by three claws; the two superior ones are curved and pectinated, and the inferior one is inflected near its base. The palpi resemble the legs in colour. The abdomen is oviform, pointed at the spinners, sparingly supplied with short hairs, glossy, convex above, and projects over the base of the cephalo-thorax; it is of a dull olive-green hue, the under part being the darkest, and along the middle of the upper part there extends a very obscure series of angular lines of a deeper shade having their vertices directed forwards; the sexual organs present two parallel, convex, glossy prominences of a red-brown colour.

An adult female of this *Linyphia* was received from Mr. R. H. Meade in September, and an immature one from the Rev. Hamlet Clark in October 1853.

*Linyphia circumspecta*.

Length of the male  $\frac{1}{14}$ th of an inch; length of the cephalo-thorax  $\frac{1}{24}$ ; breadth  $\frac{1}{36}$ ; breadth of the abdomen  $\frac{1}{36}$ ; length of an anterior leg  $\frac{5}{16}$ ; length of a leg of the third pair  $\frac{1}{8}$ .

The eyes are seated on black spots; the four intermediate ones form a trapezoid whose anterior side is the shortest, and those of each lateral pair are placed obliquely on a minute tubercle and are contiguous; the posterior eyes of the trapezoid are the largest and the anterior ones the smallest of the eight. The cephalo-thorax is oval, convex, glossy, with slight furrows on the sides converging towards an indentation in the medial line; the falces are conical, armed with a few small teeth on the inner surface, and somewhat inclined towards the sternum, which is broad and heart-shaped; the maxillæ are enlarged where the palpi are inserted, and slightly inclined towards the lip, which is semicircular and prominent at the apex; the legs are long, slender, and provided with hairs and fine spines; the first pair is the longest, then the second, and the third pair is the shortest; each tarsus is terminated by three claws; the two superior ones are curved and minutely pectinated, and the inferior one is inflected near its base. These parts are of a yellowish brown colour; the sternum, lip, and lateral margins of the cephalo-thorax are the darkest, the legs much the palest, and the falces and maxillæ are faintly tinged with red. The palpi resemble the legs in colour, with the exception of the digital joint which has a brown hue; the cubital and radial joints are short, the latter being the stronger; the digital joint is oval, with a depressed, curved process at the base, on the outer side; it is convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, prominent, with a black filiform spine at the extremity curved in a circular form, and are of a red-brown colour. The convex sides of the digital joints are directed towards each other. The abdomen is oviform, pointed at the spinners, thinly clothed with hairs, glossy, convex above, and projects over the base of the cephalo-thorax; it is of a yellowish brown colour, the under part being much the darkest, and has an obscure series of dark angular lines, whose vertices are directed forwards, extending along the middle of the upper part: between the branchial opercula there is a rather prominent transverse fold.

In the autumn 1853, males of this species, having their palpal organs fully developed, were discovered among herbage growing in woods about Oakland.

#### *Linyphia flavipes.*

Length of the male  $\frac{1}{2}$ th of an inch; length of the cephalo-thorax  $\frac{1}{24}$ ; breadth  $\frac{1}{30}$ ; breadth of the abdomen  $\frac{1}{8}$ ; length of an anterior leg  $\frac{1}{3}$ ; length of a leg of the third pair  $\frac{1}{8}$ .

The legs are long, slender, provided with hairs and fine spines, and of a pale yellow colour faintly tinged with brown; the first pair is the longest, then the second, and the third pair is the shortest; each tarsus is terminated by three claws; the two

superior ones are curved and minutely pectinated, and the inferior one is inflected near its base. The palpi have a brown-black tint; the radial joint is stronger than the cubital, and is somewhat produced in front; the digital joint is oval, with a lobe on the outer side; it is convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, protuberant, complicated in structure, with a curved prominent process near the base, on the outer side, a few very short pointed ones at the extremity, and are of a reddish brown hue. The convex sides of the digital joints are directed towards each other. The cephalo-thorax is oval, convex, glossy, with slight furrows on the sides converging towards an indentation in the medial line; the falces are conical, armed with a few teeth on the inner surface, and inclined towards the sternum, which is broad, convex, and heart-shaped; the maxillæ are straight, with the exterior angle at the extremity curvilinear; and the lip is semicircular and prominent at the apex. These parts are of a brownish black hue, the falces and maxillæ being faintly tinged with red. The four intermediate eyes form a trapezoid whose anterior side is the shortest, and those of each lateral pair are seated obliquely on a tubercle and are nearly contiguous; the anterior eyes of the trapezoid are placed on a slight protuberance and are the smallest and darkest of the eight. The abdomen is oviform, glossy, thinly clothed with hairs, convex above, projecting over the base of the cephalo-thorax, and is of a brownish black colour. Some individuals have an obscure series of slightly angular lines of a pale brown colour, whose vertices are directed forwards, extending along the upper part of the abdomen.

Adult males of *Limyphia flavipes* were found among moss in woods at Oakland in the summer of 1853.

#### Genus *Neriëne*, Blackw.

##### *Neriëne herbigrada*.

Length of the female  $\frac{1}{14}$ th of an inch; length of the cephalo-thorax  $\frac{1}{24}$ ; breadth  $\frac{1}{32}$ ; breadth of the abdomen  $\frac{1}{28}$ ; length of an anterior leg  $\frac{1}{10}$ ; length of a leg of the third pair  $\frac{1}{3}$ .

The cephalo-thorax is oval, convex, glossy, with an indentation in the medial line; the falces are powerful, conical, vertical, divergent at the extremity, and armed with teeth on the inner surface; the maxillæ are enlarged where the palpi are inserted, and inclined towards the lip, which is semicircular and prominent at the apex; and the sternum is broad and heart-shaped. These parts have a brown hue; the sternum and lip are the darkest, and the falces and maxillæ, which are the palest, are faintly tinged with red. The eyes are seated on black spots; those of each lateral pair are placed obliquely on a small tubercle, and

are contiguous, and the anterior eyes of the four intermediate ones forming the trapezoid, which are near to each other, are the smallest and darkest of the eight. The legs are provided with hairs, and have a yellowish brown hue; the anterior and posterior pairs, which are the longest, are equal in length, and the third pair is the shortest; each tarsus is terminated by three claws; the two superior ones are curved and slightly pectinated, and the inferior one is inflected near its base. The palpi resemble the legs in colour. The abdomen is oviform, hairy, glossy, convex above, and projects over the base of the cephalo-thorax; it is of a pale brown colour, with obscure spots of a deeper shade, the under part being rather the darkest; the sexual organs have a reddish brown hue, and their anterior margin is prominent and semicircular.

The colours of the sexes are similar. The male has the humeral joint of its palpi curved towards the cephalo-thorax, which has a narrow indentation immediately behind each lateral pair of eyes; the radial is larger than the cubital joint and projects a strong obtuse apophysis from its extremity, in front, towards the inner side; the digital joint is somewhat oval, with a large lobe on the outer side; it is convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, complicated in structure, with a curved prominent process at their base, on the outer side, another, situated underneath, which has its extremity enlarged and depressed, and two long, contiguous, filiform, black spines, originating near their base, on the outer side, which pass obliquely downwards, and curving round their extremity, extend considerably beyond the termination of the digital joint: the colour of these organs is red-brown.

Early in October 1853 both sexes of *Neriëne herbigrada*, in a mature state, were detected among coarse herbage and moss growing in woods on the northern slope of Gallt y Rhyg. Like *Neriëne sulcata*, this species makes a near approximation to the spiders of the genus *Walckenaëra*.

XVIII.—*On the Mechanism of Aquatic Respiration and on the Structure of the Organs of Breathing in Invertebrate Animals.*

By THOMAS WILLIAMS, M.D. Lond., Licentiate of the Royal College of Physicians, formerly Demonstrator on Structural Anatomy at Guy's Hospital, and now of Swansea.

[With two Plate.]

[Continued from p. 137.]

THE orbit of the blood-proper in the Annelid is conducted in obedience to the simplest hydraulic principles. The Annelid is